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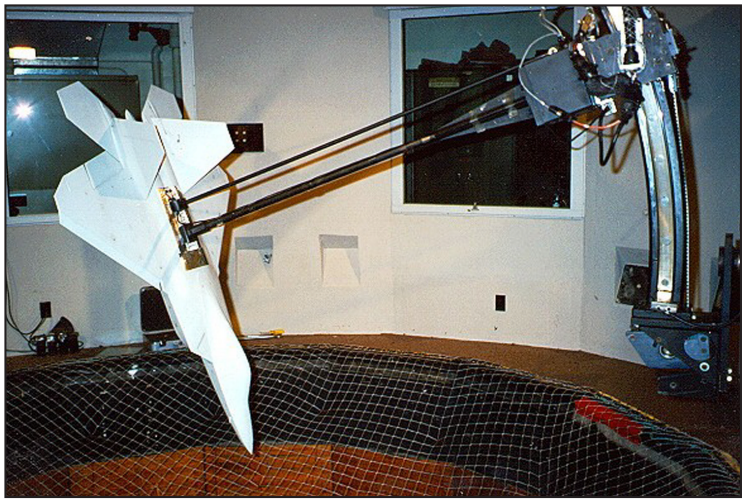
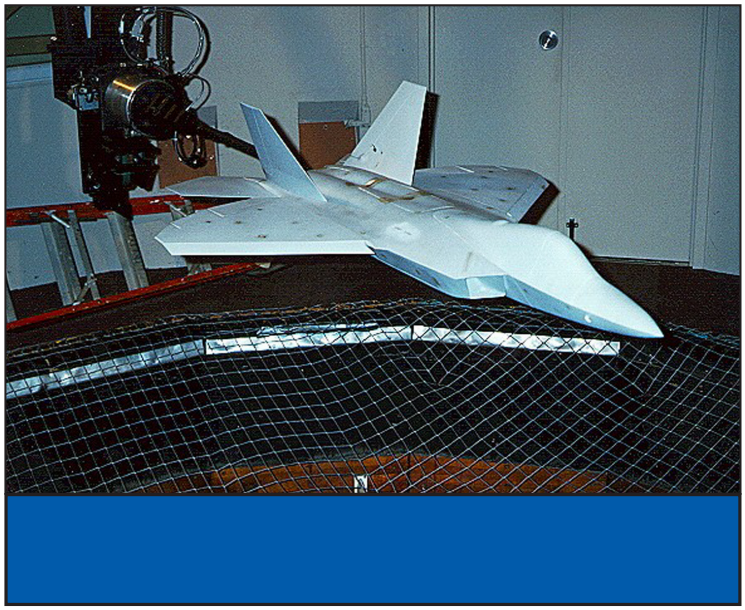
Success Story

VERTICAL WIND TUNNEL CAN NOW TEST REALISTIC AIRCRAFT MANEUVERS





A new combined motion test capability demonstrated by the Air Vehicles Directorate at Wright-Patterson AFB, Ohio, will significantly enhance the evaluation and modeling of future highly agile aircraft. This expanded test capability will also result in a reduction of required test time and a corresponding cost savings.

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Accomplishment

The directorate recently demonstrated a new combined motion test capability using a multi-axis test rig in its vertical wind tunnel (VWT). The combined motion capability identifies the traditional roll, yaw, and wind axis motions. Combining a roll or yaw body axis test motion with a rotation about the wind axis rotation achieves virtually any motion combination.

Background

The ability to simulate and model the aerodynamic forces and moments generated on highly agile aircraft in maneuvering flight is difficult. Past efforts only collected data during rotation of a model around a single vehicle axis. During an actual aircraft maneuver, however, the vehicle's axis of rotation is continually changing.

No existing rig generated the motion of a true maneuver, and researchers could only study idealized maneuvers using actual wind tunnel test data. The original multi-axis test rig in the VWT, built with several types of motion capability, used only one type of motion at a time.

Under a United States Air Force-funded Small Business Innovation Research program, Bihrle Applied Research of Hampton, Virginia, modified the rig to simultaneously combine two types of motion. This allowed the rig to simulate virtually any maneuver.

Air Vehicles
Emerging Technologies

Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTT, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (01-VA-09)